

A close-up photograph of a person's hand holding a black measuring tape against the bark of a tree. The hand is on the left, with the thumb and index finger gripping the tape. The tape is stretched horizontally across the tree trunk. The tree bark is rough and textured, with some peeling. In the background, there is a dense forest of green trees with yellow flowers. The overall scene is outdoors in a forest setting.

CHAPTER 10

Forest Management Planning

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FOREST MANAGEMENT PLANNING

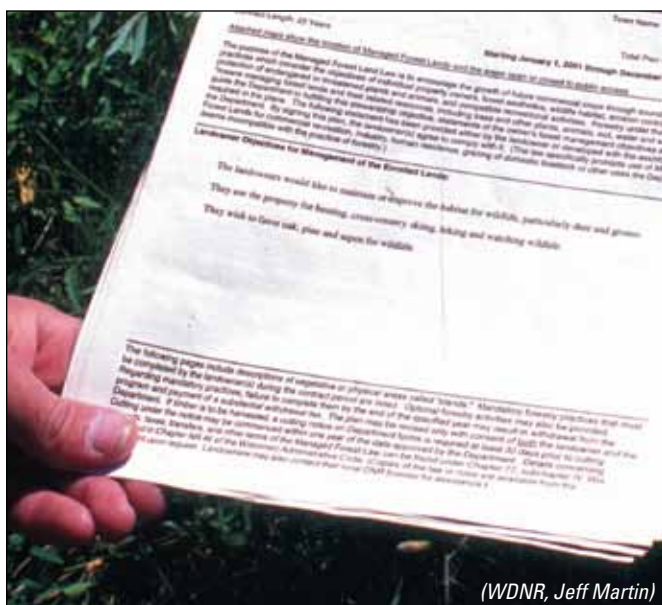
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(WDNR, Jeff Martin)

Figure 10-2: An important first step in developing a management plan is to identify the landowner's specific objectives, and list them in the written plan.

STEP TWO: CONDUCTING A SITE EVALUATION AND DELINEATION OF SITE TYPES

Secure aerial photographs, topographic maps, soil surveys, Natural Heritage Inventory (NHI), cultural heritage, and other resources available to analyze the property. Sources of this information include local offices including: Soil and Water Conservation District (SWCD), USDA Natural Resource Conservation Services (NRCS), Department of Natural Resources (DNR), and county land departments.

Conduct an on-the-ground evaluation of the land. It is important to have firsthand knowledge of the area being considered. Evaluate soil conditions to determine tree species, preferred seasons of operation, site preparation and regeneration techniques, and other information related to forest management decisions. Identify resources, features and site conditions that may require special attention (e.g., perennial and intermittent streams, lakes, wetlands and seasonal ponds, steep slopes, rock outcrops, unstable or poorly-drained soils, sinkholes, seeps and springs, infestations of invasive species, deer herbivory, snags and nesting sites). Assess cultural resource potential, and endangered, threatened or specialist interest (ETS) species.



(WDNR, Jeff Martin)

Figure 10-3: Frequent communication between the forester, landowner and other resource professionals helps insure management objectives are fully achieved.

While identifying the physical characteristics of a site, think about how the characteristics might affect the planning and design of a particular forest management activity. Some of these considerations include soil capabilities and limitations; location and width of filter strips and riparian management zones (RMZs); stream crossings; visual sensitivity; and the network of access roads, approaches, trails, and landings needed to access the site.

Delineate site types (see Chapter 2: Generally Accepted Silvicultural Principles). Land within an ownership can be relatively homogeneous or heterogeneous in terms of its ecological capability. Major factors affecting species' ability to grow, reproduce and compete include soil depth, texture and chemical properties, and position on the landscape (such as north or south slope aspect, ridge or valley, etc.). Any areas within the ownership that can be differentiated on the basis of such factors should be identified as "site types." In some areas, formal site classification systems have been developed.

STEP THREE: DELINEATION OF STANDS WITHIN SITE TYPES

Because stands (vegetative units) represent communities of different compositions and structure, and therefore different stages of development cycles, they must be considered separately if management based on ecological principles is to be attempted. Each stand is considered to be an “ecological opportunity unit.” A forest manager may elect to divide a site type into more than one stand in order to apply a mixture of treatments (or passive management) to meet a variety of landowner objectives.

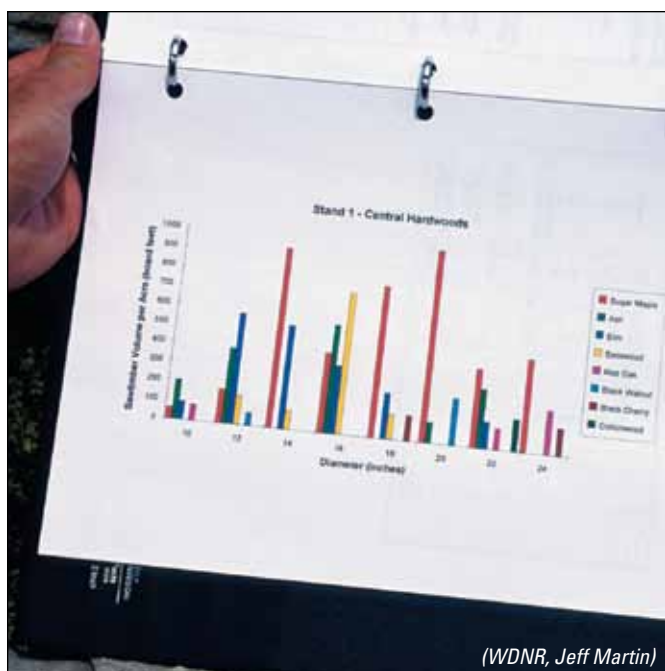
STEP FOUR: IDENTIFICATION OF SILVICULTURAL AND ECOLOGICAL ALTERNATIVES FOR EACH STAND

Short- to mid-term compositional and structural changes in most vegetation units are relatively predictable. Current development trends, however, are not necessarily the only ecologically acceptable pathways, and they may not meet the landowner’s goals. Before deciding on the most viable management option, a resource professional should attempt to identify other ecological alternatives.

Each stand, if properly delineated, can be expected to respond uniformly to a given natural disturbance or management action. Although there are definite limitations due to site, stand composition, and availability of external seed sources, there is almost always more than one ecologically sound silvicultural alternative available. All too often, regenerating the existing cover type is the only option considered. Such a choice may not always be ecologically desirable, nor may it best meet the landowner’s goals. More management options can be offered to the landowner if all ecologically feasible alternatives are first identified.

Systematically identify ecological and silvicultural alternatives by evaluating the following factors:

- **Successional role of each species comprising the current stand (overstory and understory).** This information is essential for planning changes in stand composition and regeneration techniques.
- **The age structure of the stand.** Species and age structure are two fundamental properties of any forest stand. They must be taken into account in any management consideration.
- **Relative growth potential of each species on the identified site type.** This may be the most important information for any management decision because growth potential relates not only to economic outputs, but also strongly affects forest dynamics.
- **Presence of advance regeneration.** Presence of advance reproduction to a large extent dictates the type of regeneration techniques that will be applied. Also, advance reproduction may or may not be of the desired species.
- **Expected reaction of advance regeneration to different types of stand manipulation.** If advance reproduction is of mixed species, different growth rates can be expected with different degrees of canopy removal. Seedlings of most species benefit from complete canopy removal, but some shade-tolerant species respond best to gradual canopy removal.
- **Expected effect of competing vegetation after opening of the canopy.** Understory plant species respond differentially to removal of the forest canopy, and present different degrees of competition to tree seedlings. Response of competing vegetation also varies among site types. Generally, the more mesic the site, the stronger the understory competition. However, potential competing species are not necessarily present in every stand. Some non-native invasive plants are very competitive and can limit regeneration and growth (see [3.1](#), [3.3](#) and [4.3](#)).
- **Potential for inducing advance reproduction of each canopy species.** Regeneration requirements vary greatly with species. Some conditions are more difficult to meet artificially than others.
- **Existing and potentially-damaging agents.** Some species are more susceptible to specific damaging agents (e.g., deer herbivory, insects, pathogens, frost, windthrow) in certain regions or on specific site types.



(WDNR, Jeff Martin)

Figure 10-4: An inventory of each stand will provide basic information to guide management decisions. The chart in this photo indicates the board-foot volume per acre by species and diameter for a specific stand.

STEP FIVE: IDENTIFICATION OF VIABLE ALTERNATIVES BY EVALUATING LANDOWNER'S CONSTRAINTS AND OPPORTUNITIES

- **Landowner's Resource Constraints:** Some silvicultural and ecological opportunities identified previously may not meet an owner's financial expectations, or may exceed their commitment of time.
- **Regional and Landscape Ecological Issues and Concerns:** Management practices that are ecologically sound on a site or local ecosystem level may not address landscape and regional concerns. Although private owners are not obligated to consider regional ecological concerns (other than those specifically covered by law, e.g., the Endangered Species Act), many of them are interested and often eager, to accommodate them within limits of economic efficiency. Resource professionals working with private owners should be aware of such issues, and bring them to the owner's attention when preparing management plans. Such issues vary greatly from region to region, and cannot be addressed comprehensively.

The following are some examples of regional ecological considerations:

- Lack of large contiguous blocks of specific habitats to accommodate wide-ranging animal species, or those that do not thrive in edge habitats.
- Need for special wooded corridors to accommodate movement of some animal species between suitable habitat patches.
- Loss of certain vegetation types (and accompanying fauna) due to changes in natural disturbance regimes (e.g., loss of oak savannas or pine forests due to suppression of wild fires).
- Shortage of mature stages of forest development due to uniformly applied economic rotation age.
- Reduced compositional and structural diversity of forest communities due to prevailing management practices.
- Lack of tree regeneration, and reduction of shrub/herb density and diversity due to high deer populations.
- Management of an invasive insect or disease such as the emerald ash borer or beech bark disease.

Additional information ecological considerations can be found in landscape-level documents like the Ecological Landscape Handbook and the Wildlife Action Plan (see the Resource Directory for more information).

- **External Socioeconomic Constraints:** Certain activities may be constrained by zoning laws, local and regional land use plans or forest practice regulations, while others may simply conflict with the prevailing attitudes of neighbors or the general public. While the latter doesn't bind an owner, a conscientious resource professional will keep landowners informed in order to minimize potential future conflicts.
- **Socioeconomic Incentives:** Socioeconomic constraints often can be balanced by incentives. These may include lower property taxes on managed forestland, income tax deductions for forest management investments, government cost-sharing for management practices, and others. Some practices may also engender greater public acceptance than others without compromising a landowner's goals.

STEP SIX: DEVELOP MANAGEMENT OBJECTIVES FOR EACH STAND

The steps described previously identify ecologically sound silvicultural alternatives for individual stands, and eliminate from consideration those that cannot be supported on socioeconomic terms. The landowner now must select the management (or silvicultural) objectives for each stand (i.e., what to grow and how to grow it, as explained in Chapter 2, page 2-35).

STEP SEVEN: PREPARING THE MANAGEMENT PLAN

Only when management objectives have been defined through this type of process should the management plan (i.e., the “action plan”) be developed. The management plan is a written document that

summarizes all of the above information, and then clearly prescribes management unit activities and a timeline for accomplishing them.

Detailed silvicultural prescriptions are not part of the initial management plan – these are developed immediately prior to a scheduled management practice in order to take into account unique stand conditions. For example, a timber harvest or tree planting project should have a detailed project plan with specific instructions or performance criteria.

A suggested process to develop management options is depicted in Figure 10-7. It should be emphasized that this is a process (i.e., a sequence of steps to consider) and not an outline of items to be specifically included in actual management plans (which are covered in Table 10-1, see pages 10-8 and 10-9).

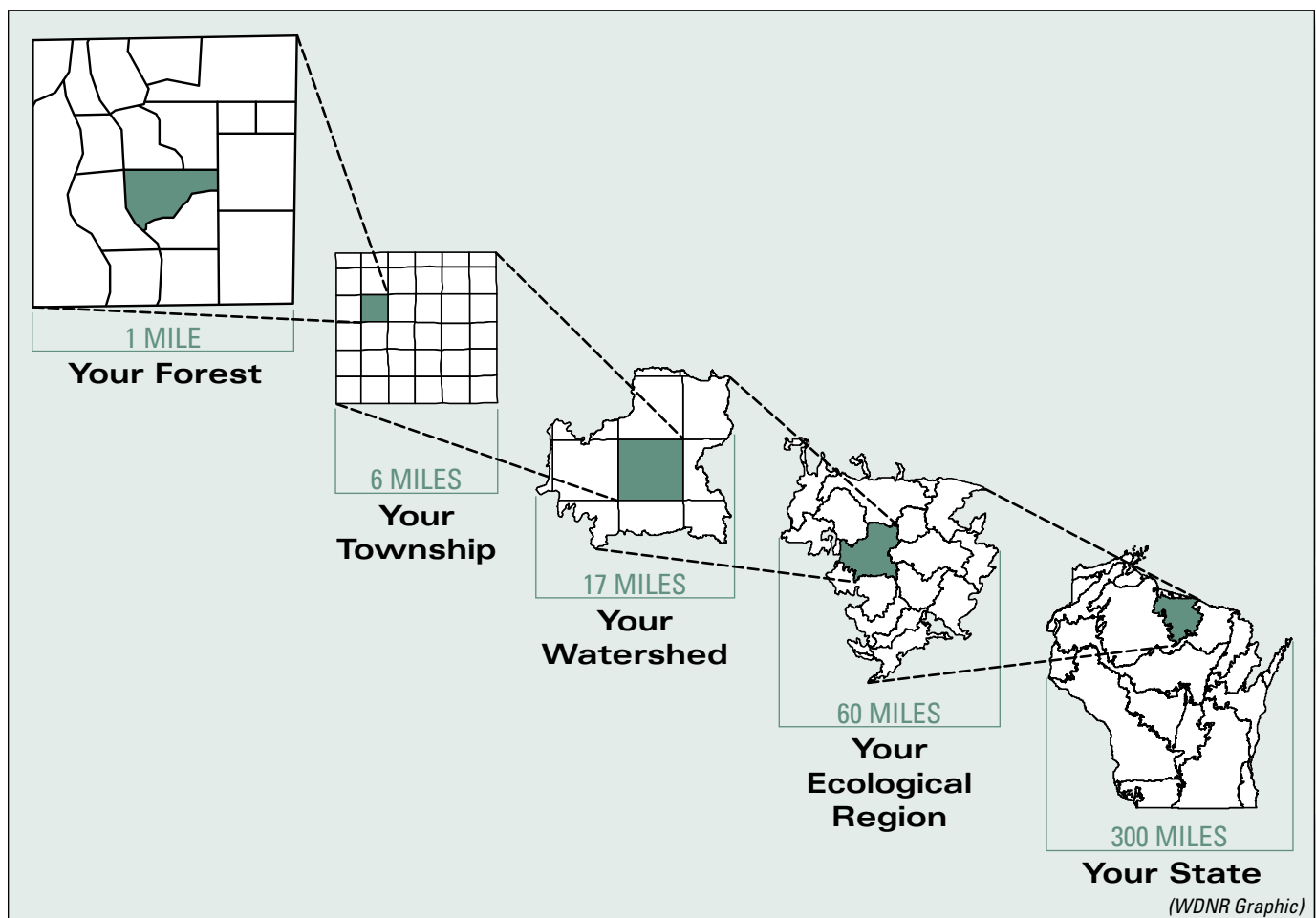


Figure 10-5: Understanding how your property is connected can help to understand how management locally impacts the resources in the township, the watershed, the state and beyond. Some landscape level tools are identified in the Resource Directory.



(WDNR, Jeff Martin)

Figure 10-6: Having a trained forester collect inventory data for each stand on the property is necessary before prescriptions can be developed to achieve the management objectives.

Forest Management Plan Elements

As noted at the beginning of this chapter, a forest management plan may be brief or detailed, depending on its purpose and the interests of the landowner. For purposes of state and federal programs in Wisconsin, forest management plans usually fall into two categories:

- **Basic Plans** address a specific management practice(s) and may be in the form of a letter or summary of management prescriptions. They are often used as a follow-up to an initial contact with a new landowner to augment verbal recommendations, and lay the groundwork for further action in the future. A Basic Plan might not meet the plan standard requirements for cost-sharing or forest tax programs, but should still incorporate the sustainable forestry principles described in the first section of this chapter.
- **Comprehensive Plans** such as Managed Forest Law (MFL) Plans and Forest Stewardship (FS) Plans, are more complete than Basic Plans. They incorporate sustainable forestry principles and may go into some detail to identify and describe activities to enhance or protect soil, water, aesthetic quality, recreation, timber, water, and fish and wildlife resources based on the landowner's objectives for the land.

BMPs: Invasive Species

The following are Forestry BMPs for Invasive Species (IS-BMPs) to consider when preparing a forest management plan.

- 3.1 Include a strategy for managing invasive species.
- 3.3 Consider the need for action based on:
 - 1) the degree of invasiveness; 2) severity of the current infestation; 3) amount of additional habitat or hosts at risk for invasion; 4) potential impacts; and, 5) feasibility of control with available methods and resources.
- 4.3 Consider the likely response of invasive species or target species when prescribing activities that result in soil disturbance or increased sunlight.

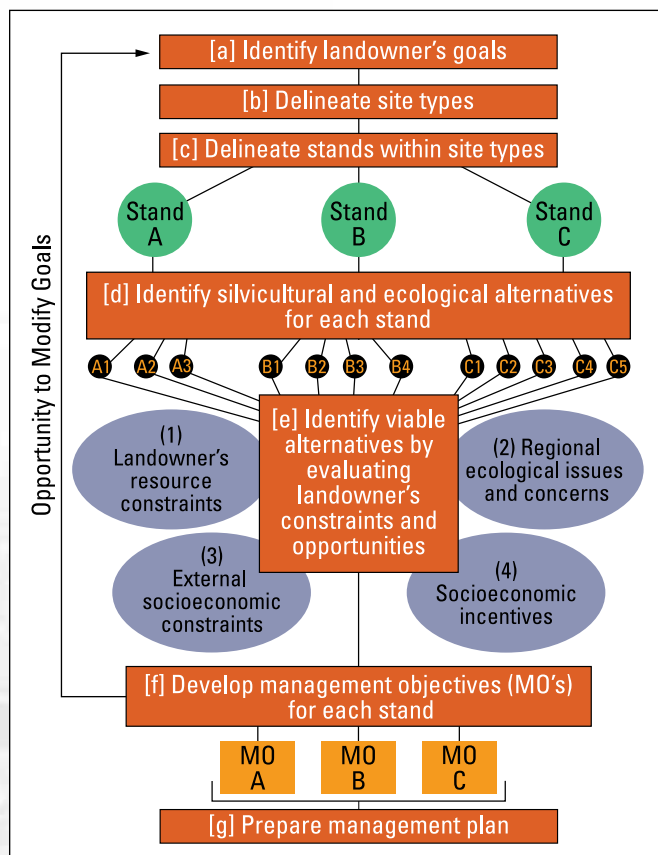


Figure 10-7: Model of an approach to the development of ecologically sound forest management plans.

(Figure adapted from Kotar, page 14)

▲ Required ● Recommended	MANAGED FOREST LAW PLAN	FOREST STEWARDSHIP PLAN ¹	BASIC PLAN ²
#1: IDENTIFICATION			
a. Landowner name, address, with necessary signatures and dates.	▲	▲	▲
b. Landowner signature of approval.	▲	▲	
c. Plan preparer name, address and phone number.	▲	▲	▲
d. Plan preparation date.	▲	●	▲
e. Legal description (T, R, S minimum).	▲	▲	▲
f. Planned acres.	▲	▲	▲
g. Plan length (shows number of years covered by the plan).	▲	●	
h. Overall landowner goals and objectives for the property.	▲	▲	●
i. The pages are numbered sequentially; order number on all pages.	▲		
#2: DESCRIPTION <i>(May be presented in a narrative or tabular format as appropriate.)</i>			
a. Map with property boundaries, cover types, water, roads, adjoining land use, acreage, etc. clearly and adequately labeled.	▲	▲	
b. General property description.	▲	▲	
c. Regional landscape overview.	▲	●	
d. Interaction with surrounding properties.	●	●	
e. Soils information (can be generalized over entire property when soils are uniform; may be included in a data table).	▲	▲	
f. Stands by cover type and area (acres).	▲	▲	▲
g. Descriptive overview of the timber type.	▲	●	●
h. Stand silvicultural objective (what you are trying to grow and how you intend to achieve it : indicate target timber type or land cover type and the even-aged or uneven-aged technique that will be used to get there). Provide a link to the landowner's objectives where practical.	▲	▲	▲
i. Forest characteristics: Land Exam Form 2450-128 Part A (and Part B for MFL) or similar stand-based table. (Providing a copy to the landowner is recommended, though not required.)	▲	▲	
j. Plan addresses known threatened and endangered species and cultural/historical resources.	▲	▲	▲

¹ Requirements for Forest Stewardship Plan are based on the Forest Stewardship Program National Standards and Guidelines. MFL plans are Forest Stewardship plans and must include the same requirements.

² Foresters should include components in addition to those designated in the chart as appropriate to the situation for each individual basic plan.

Table 10-1: Wisconsin Forest Management Plan Standards which summarizes recommended and required elements in forestry plans (continued on page 10-9).

▲ Required ● Recommended
PLAN COMPONENT

**MANAGED FOREST
LAW PLAN**

**FOREST
STEWARDSHIP PLAN¹**

**BASIC
PLAN²**

#3: MANAGEMENT ACTIVITIES

a. Recommendations consider landowner's available time, interest, money, and energy based on landowner's objectives.	●	●	●
b. Plan identifies actions (practices) to be taken by the landowner to protect soil, water, range, aesthetic quality, recreation, timber, and fish and wildlife resources in a manner that is compatible with landowner objectives.	▲	▲	●
c. MFL Mandatory Practices ³	▲		
d. MFL Non-mandatory Practices ³	▲		
e. Year practices should/must be completed (a chronological summary of mandatory or non-mandatory activities is also desirable, but not required).	▲	●	●
f. Enforceable language: specific requirements as appropriate (basal area residuals, trees per acre, follow-up requirements, etc.).	▲		
g. Prescriptions are consistent with Wisconsin DNR approved silvicultural standards.	▲	▲	▲
h. Gypsy moth control considerations	▲		
i. Fire ⁴ : include considerations for wildfire protection and planning.	▲	▲	
j. Carbon Cycle ⁴ : include considerations for sequestering carbon.	▲	▲	

#4: PRESENTATION

a. The plan information is presented in a logical format that is easy to follow.	●	●	●
b. The writing style is easy to read and understand and presented in a professional manner.	●	●	●
c. The writer reasonably avoids wordiness, jargon, and mistakes in grammar, spelling and formatting.	●	●	●
d. The plan meets the landowner's needs and provides useful advice in a skillful way.	●	●	●

¹ Requirements for Forest Stewardship Plan are based on the Forest Stewardship Program National Standards and Guidelines. MFL plans are Forest Stewardship plans and must include the same requirements.

² Foresters should include components in addition to those designated in the chart as appropriate to the situation for each individual basic plan.

³ Mandatory and non-mandatory (optional) practices are required to be included in MFL plans to the extent needed to address sound forestry and the landowners' objectives listed in the plan.

⁴ A general statement will be inserted into the MFL and Forest Stewardship management plan templates to address these Forest Stewardship requirements.

Table 10-1: Wisconsin Forest Management Plan Standards which summarizes recommended and required elements in forestry plans (continued from page 10-8).